

AMENDMENTS TO THE CLAIMS

WE CLAIMS (clean copy)

- 5 1 (Currently amended) A method of performing protection switching in a communications network, the method comprising:
- a) on an ongoing basis, providing forward error correction (FEC) coding for data transmitted on the communications network and monitoring a raw bit error rate (BER) determined prior to performing the error correction based on the FEC coding in
- 10 respect of a first path through the communications network;
- b) on an ongoing basis, determining a first order derivative of said raw BER based on at least one previous raw BER and a current raw BER;
- (c) determining a predicted raw BER at a next time interval based on the current BER and said first order derivative; and
- 15 d) comparing the predicted BER with a predetermined threshold, and if the predicted raw BER is exceeding the threshold, instigating a switch to a protection path through the network.
- 2 (Canceled) A method according to claim 1 further comprising:
- providing forward error correction coding for data transmitted on the
- 20 communications network;
- wherein the raw quality measure is a raw bit error rate (BER) determined prior to performing error correction based on the forward error correction coding.
- 2a. (New) A method as described in claim 1, wherein the step (b) further
- 25 comprises determining a second order derivative of the raw BER based on the previously measured raw BERs and the current raw BER, and the step (c) comprises determining the predicted raw BER at the next time interval based on the current BER and said first and second order derivatives.

2b. (New) A method as described in claim 2a, wherein the step (b) further comprises determining at least one third or higher order derivative of the raw BER based on the previously measured raw BERs and the current raw BER, and the step (c) comprises determining the predicted raw BER at the next time interval based on the current BER and said derivatives.

3 (Currently amended) A method according to claim 1 wherein the first path is a path for a wavelength channel through an optical network.

4 (Canceled) A method according to claim 1 wherein deciding on the basis of the quality measure whether a failure is likely to occur in the immediate future comprises comparing the quality measure to a threshold.

5 (Currently Amended) A method according to claim 1 wherein the step (c) comprises determining if the predicted BER crosses two thresholds within a time shorter than a predetermined time.

6 (Canceled) A method according to claim 1 wherein deciding on the basis of the quality measure whether a failure is likely to occur in the immediate future comprises comparing the quality measure to a threshold, and if the quality measure exceeds the threshold, also analyzing previous quality measures to decide whether the quality measure exceeding the threshold is likely an ongoing condition which is likely to stabilize, or a condition which will likely result in a failure in the immediate future.

7 (Canceled) A method according to claim 6 wherein analyzing previous quality measures to decide whether the quality measure exceeding the threshold is likely an ongoing condition which is likely to stabilize, or a condition which will likely result in a failure in the immediate future comprises determining if previous readings have changed by greater than a predetermined amount.

8 (Canceled) A method according to claim 1 further comprising completing the switch to the protection path before failure of the first path.

9 (Currently amended) A method according to claim 1 wherein the protection path is a path available for a wavelength channel.

10 (Original) A method according to claim 1 wherein the protection path is a dedicated path for the first path.

11 (Original) A method according to claim 1 wherein:

instigating a switch to a protection path through the network is done for higher priority traffic before being done for lower priority traffic.

12 (Currently amended) A method according to claim 1 wherein the raw
5 BER measure in respect of the first path through the communications network comprises a BER measurement for each of the light paths making up the first path.

13 (Currently amended) A method according to claim 1 further
comprising making connection routing decisions for new connection requests taking into consideration raw bit error rates collected for the network in a manner which
10 encourages the use of links/paths with good raw BER over links/paths with poor raw BER.

14 (Canceled) A method according to claim 1 wherein the raw quality measure is a function of one or more raw quality measures taken for light sections forming part of said path.

15 15 (Canceled) A method according to claim 2 wherein deciding on the basis of the raw quality measure whether a failure is likely to occur in the immediate future comprises:

determining a first order derivative based on at least one previous raw BER and a current raw BER;

20 predicting a predicted raw BER at a next time interval based on the current BER and the derivative; and

deciding a failure is likely to occur in the immediate future if the predicted raw BER is greater than a predetermined threshold value.

25 16 (Canceled) A method according to claim 2 wherein deciding on the basis of the raw quality measure whether a failure is likely to occur in the immediate future comprises:

determining at least one second or higher order derivative based on one or more previously measured raw BERs and a current raw BER;

predicting a predicted raw BER at a next time interval based on the current BER and the at least one second or higher order derivative;

5 deciding a failure is likely to occur in the immediate future if the predicted raw BER is greater than a predetermined threshold value.

17 (Currently amended) A method of performing protection switching in an optical communications network, the method comprising:

10 a) on an ongoing basis, providing forward error correction (FEC) coding for data transmitted on the communications network and monitoring a raw bit error rate (BER) determined prior to performing the error correction based on the FEC coding in respect of a first light path between components in an optical communications network;

15 b) on an ongoing basis, determining a first order derivative of said raw BER based on at least one previously measured raw BER and a current raw BER;

(c) determining a predicted raw BER at a next time interval based on the current BER and said first order derivative; and

20 d) comparing the predicted BER with a predetermined threshold, and if the predicted raw BER is exceeding the threshold, instigating a switch to a protection link through the network, and switching at least one service from the first light path to the protection light path.

17a. (New) A method as described in claim 17, wherein the step (b) further comprises determining a second order derivative of the raw BER based on the previously measured raw BERs and the current raw BER, and the step (c) comprises
25 determining the predicted raw BER at the next time interval based on the current BER and said first and second order derivatives.

17b. (New) A method as described in claim 17a, wherein the step (b) further comprises determining at least one third or higher order derivative of the raw BER based on the previously measured raw BERs and the current raw BER, and the step (c)

comprises determining the predicted raw BER at the next time interval based on the current BER and said derivatives.

18 (Original) A method according to claim 17 wherein instigating a switch to the protection light path is done in a sequence based on priority of the services.

5 19 (Original) A method according to claim 17 further comprising making connection routing decisions for new connection requests taking into consideration raw bit error rates collected for the network in a manner which encourages the use of paths/light paths with good raw BER over paths/light paths with poor raw BER.

20 (Canceled) A method according to claim 17 wherein the raw quality
10 measure is a function of one or more raw quality measures taken for light sections forming part of said light path.

21 (Currently amended) A network node comprising:

an input for receiving on an ongoing basis raw BER measurements in respect of a path through a network of which the network node forms a part; and

15 a decision means adapted to, on an ongoing basis, to determine a first order derivative of said raw BER based on at least one previous raw BER and a current raw BER, to determine a predicted raw BER at a next time interval based on the current BER and said first order derivative, and to instigate a switch to a protection path through the network if the predicted raw BER is exceeding a threshold.

20 22 (Currently amended) A network node according to claim 21 adapted for use in an optical network, wherein the first path is a path for a wavelength channel through an optical network.

23 (Canceled) A network node according to claim 22 further adapted to complete the switch to the protection path before failure of the first path.

25 24 (Original) A network node according to claim 21 adapted to transmit traffic of differing priorities on said path, and adapted to instigate a switch to a protection path through the network for higher priority traffic before doing so for lower priority traffic.

25 (Original) A network node according to claim 21 wherein the raw BER measurements comprise a BER measurement for each link making up the first path.

26 (Original) A network node according to claim 21 further comprising:

- 5 a network routing component adapted to make connection routing decisions in respect of new connection requests, the network routing component being adapted to take into consideration the raw bit error rates collected for the network in a manner which paths/light paths with poor raw BER.